



# Paging in Common Routing Area for 2G and 3G

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## Feature Description

If the RA is configured in both 2G and 3G, the SGSN now supports paging in both the RATs. In previous releases common Routing Area across 2G and 3G was not supported completely. Paging was done only in the last known RAT and power-off detach from other RAT was not supported.

With the introduction of this feature, the following enhancements have been made:

1. If paging has to be done in RA which is common across the RATs, the SGSN supports paging initiation in both the RATs.
2. The SGSN accepts power-off detach from the common RA.
3. If the MS is in STANDBY or PMM-IDLE state and a downlink packet arrives at the SGSN, paging is done. This is applicable for both A/Gb and Iu modes.

GPRS detach (power-off) may be initiated by the MS, but as the request is received in switched off mode the core network does not send a Detach Accept. When the Routing Area is shared across (Iu/Gb), the Detach Request is accepted at any of the modes and the subscriber details are cleared.

## How it Works

This section describes the support for common Routing Area (RA) for 2G and 3G in detail. Consider the following 2G and 3G scenarios:

### Paging in Common Routing Area for 2G subscriber

The Subscriber is attached in 2G and is in Standby state. Downlink data is received at the SGSN and it starts paging in both 3G and 2G as the RA is shared.

**Scenario-1:**

- A detach request (power off) is sent in 3G, stop paging in 2G
- Handle the detach request (power off).

**Scenario-2:**

- If detach request (power off) is sent in 3G, stop paging in 3G
- Indicate to the 2G network

**Scenario-3:**

- If page response arrives in 2G, stop paging in 3G
- Handle the page response in 2G.

**Scenario-4:**

- If service request arrives in 3G, drop the packet.

Any packet other than RAU, Attach and Detach (power off) as page response will be dropped in the other RAT.

In paging policy has to be RA based under GPRS service to initiate common RA paging.

To enable common Routing Area paging, the configured paging-policy under the GPRS service must be Routing Area based. If the paging-policy configuration is not Routing Area based BSSGP paging, this feature will not be supported though the Routing Area is shared.

## Paging in Common Routing Area for 3G subscriber

The Subscriber is attached in 3G and is in an IDLE state. Downlink data is received at the SGSN and it starts paging in both 3G and 2G as the RA is shared.

**Scenario-1:**

- If a detach request (power off) is sent in 3G, stop paging in 2G.
- Handle detach request (power off).

**Scenario-2:**

- If a detach request (power off) is sent in 2G, stop paging in 2G.
- Indicate to 3G network.

**Scenario-3:**

- If service request is sent in 3G, stop paging in 2G.
- Handle the page response in 3G.

**Scenario-4:**

- If a page response (LLC PDU) arrives in 2G, drop the packet.

Any packet other than RAU, Attach and Detach (power off) as page response will be dropped in the other RAT.

The paging algorithm under GPRS service will be applicable if a BSSGP page is done for 3G subscriber. If the paging-policy configuration is not Routing Area based BSSGP paging, this feature will not be supported though the Routing Area is shared.

Once a valid response arrives, both the RANAP page and BSSGP page will be stopped. However, in case of expiry the other RAT will not be informed it will continue to page.

## Standards Compliance

Support for Paging in Common Routing Area for 2G and 3G complies with the following standard:

- 3GPP TS 23.060 (version 10.0)

## Configuring Paging in Common Routing Area for 2G and 3G

The following command is configured to enable support for this feature:

```
config
sgsn-global
no common-ra-paging
exit
```

This command enables paging across common Routing Area (RA) for 2G and 3G. For more information on this command, see the *Command Line Interface Reference*.

## Verifying the Paging in Common Routing Area for 2G and 3G Configuration

Execute the following command to verify the configuration of this feature:

### show sgsn-mode

The following parameter indicates if common Routing Area paging is "Enabled" or "Disabled":

- Common RA Paging

## Monitoring and Troubleshooting Paging in Common Routing Area for 2G and 3G feature

This section provides information on the show commands and bulk statistics available to support this feature.

## Paging in Common Routing Area for 2G and 3G Show Command(s) and/or Outputs

This section provides information regarding show commands and/or their outputs in support of the Paging in Common Routing Area for 2G and 3G feature:

### show gmm-sm statistics

The following new parameters are added to this show command to display the statistics for this feature:

#### Paging Statistics

- Total-CRA-Page-Req-Same-RAT
- 3G-PS-CRA-Page-Req
- Total-CRA-Page-Ret-Same-RAT

- 3G-PS-CRA-Page-Ret-Req-in-2G
- Total-CRA-Page-Req-Other-RAT
- 3G-PS-CRA-Page-Req-in-2G
- Total-CRA-Page-Ret-Other-RAT
- 3G-PS-CRA-Page-Ret-Req
- Total-CRA-Page-Rsp-Same-RAT
- 3G-PS-CRA-Page-Rsp
- Total-CRA-Page-Rsp-Other-RAT
- 3G-PS-CRA-Attach-from-2G
- 3G-PS-CRA-RAU-from-2G
- 3G-PS-CRA-Power-Off-from-2G
- Total-CRA-Page-TO-Other-RAT
- 3G-PS-CRA-Timeout-in-2G
- Total-CRA-Page-Stop
- 3G-PS-CRA-Page-Stop
- 2G-PS-CRA-Page-in-3G
- 2G-PS-CRA-Page-Ret-Req-in-3G
- 2G-PS-CRA-Page-Req
- 2G-PS-CRA-Page-Ret-Req
- 2G-PS-CRA-Page-Rsp
- 2G-PS-CRA-Attach-from-3G
- 2G-PS-CRA-RAU-from-3G
- 2G-PS-CRA-Power-Off-from-3G
- 2G-PS-CRA-Timeout-in-3G
- 2G-PS-CRA-Page-Stop

#### Non-Paging Statistics

- 3G-CRA-Attach
- 3G-CRA-RAU
- 3G-CRA-Power-Off
- 2G-CRA-Attach
- 2G-CRA-RAU
- 2G-CRA-Power-Off

## Paging in Common Routing Area for 2G and 3G Bulk Statistics

The following statistics are included in the SGSN Schema in support of this feature:

#### SGSN Schema

- common-ra-3g-page-req-same-rat
- common-ra-2g-page-req-same-rat
- common-ra-3g-page-req-ret-same-rat
- common-ra-2g-page-req-ret-same-rat
- common-ra-3g-page-req-other-rat
- common-ra-2g-page-req-other-rat
- common-ra-3g-page-req-ret-other-rat

- common-ra-2g-page-req-ret-other-rat
- common-ra-3g-page-rsp-same-rat
- common-ra-2g-page-rsp-same-rat
- common-ra-3g-page-rsp-attach-other-rat
- common-ra-2g-page-rsp-attach-other-rat
- common-ra-3g-page-rsp-rau-other-rat
- common-ra-2g-page-rsp-rau-other-rat
- common-ra-3g-page-rsp-power-off-other-rat
- common-ra-2g-page-rsp-power-off-other-rat
- common-ra-3g-page-timeout-other-rat
- common-ra-2g-page-timeout-other-rat
- common-ra-3g-page-stop
- common-ra-2g-page-stop
- common-ra-3g-attach-other-rat
- common-ra-2g-attach-other-rat
- common-ra-3g-rau-other-rat
- common-ra-2g-rau-other-rat
- common-ra-3g-power-off-other-rat
- common-ra-2g-power-off-other-rat

For descriptions of these variables, see "SGSN Schema Statistics" in the *Statistics and Counters Reference*.

